LOCKHEED MARTIN

Titan II

Lockheed Martin refurbished deactivated Titan II intercontinental ballistic missiles (ICBM) for use as space launch vehicles under a contract to the U.S. Air Force, Space and Missile Systems Center. The company was awarded a contract in January 1986 to refurbish, integrate, and launch 14 Titan II ICBMs for government space launch requirements.

Tasks involved in converting the Titan II ICBMs into space launch vehicles include modifying the forward structure of the second stage to accommodate a payload; manufacturing a new 10-foot-diameter payload fairing with variable lengths plus payload adapters; refurbishing the Titan's liquid rocket engines; upgrading the inertial guidance system; developing command, destruct, and telemetry systems; performing payload integration; and modifying Vandenberg Air Force Base Space Launch Complex-4 West to conduct the launches.

Titan II space launch vehicles have been launched from Vandenberg Air Force Base, California, since September 5, 1988, with a Mission Success® record of 100%.

The Titan II space launch vehicle is a two-stage, liquid-fueled booster designed to provide a small-to-medium weight class capability. It is able to lift approximately 4,200 pounds into a polar low-Earth circular orbit.

Lockheed Martin built more than 140 Titan II ICBMs— once the mainstay of America's strategic deterrent force. Titan IIs also were flown in NASA's Gemini manned space program in the mid-1960s. Deactivation of the Titan II ICBM system began in July 1982 and was completed in June 1987. Deactivated missiles are in storage at Davis-Monthan Air Force Base in Tuscon, Arizona.

Specifications

First Stage	Length:	70 feet
	Diameter:	10 feet
	Engine Thrust:	474,000 pounds (vacuum)
	ISP:	296 sec (vacuum)
Second Stage	Length:	40 feet
	Diameter:	10 feet
	Engine Thrust:	100,000 pounds (vacuum)
	ISP:	316 sec (vacuum)
Guidance and Navigation	Inertial Guidance System Consisting of Inertial Measurement Unit and Missile Guidance Computer	
	Subcontractor:	Litton
Payload Fairing	Diameter:	10 feet
	Lengths:	20 to 30 feet
	Aluminum Skin-Stringer Tri-Sector Design	
	Subcontractor:	Boeing
Liquid Rocket Engine	Refurbished Titan II ICBM Engines	
	Propellant:	Nitrogen Textroxide, Aerozine 50
	Subcontractor:	Aerojet TechSystems Co.

Diagram A

Lockheed Martin refurbishes decommissioned Titan ICBMs for use as space launch vehicles. Here a Titan II Stage I is inspected after arriving at Lockheed Martin's Titan manufacturing facility near Denver, Colorado.

Lockheed Martin Space Systems Company
Astronautics Operations
P.O. Box 179, MS DC 1020
Denver, CO 80201

04.2002